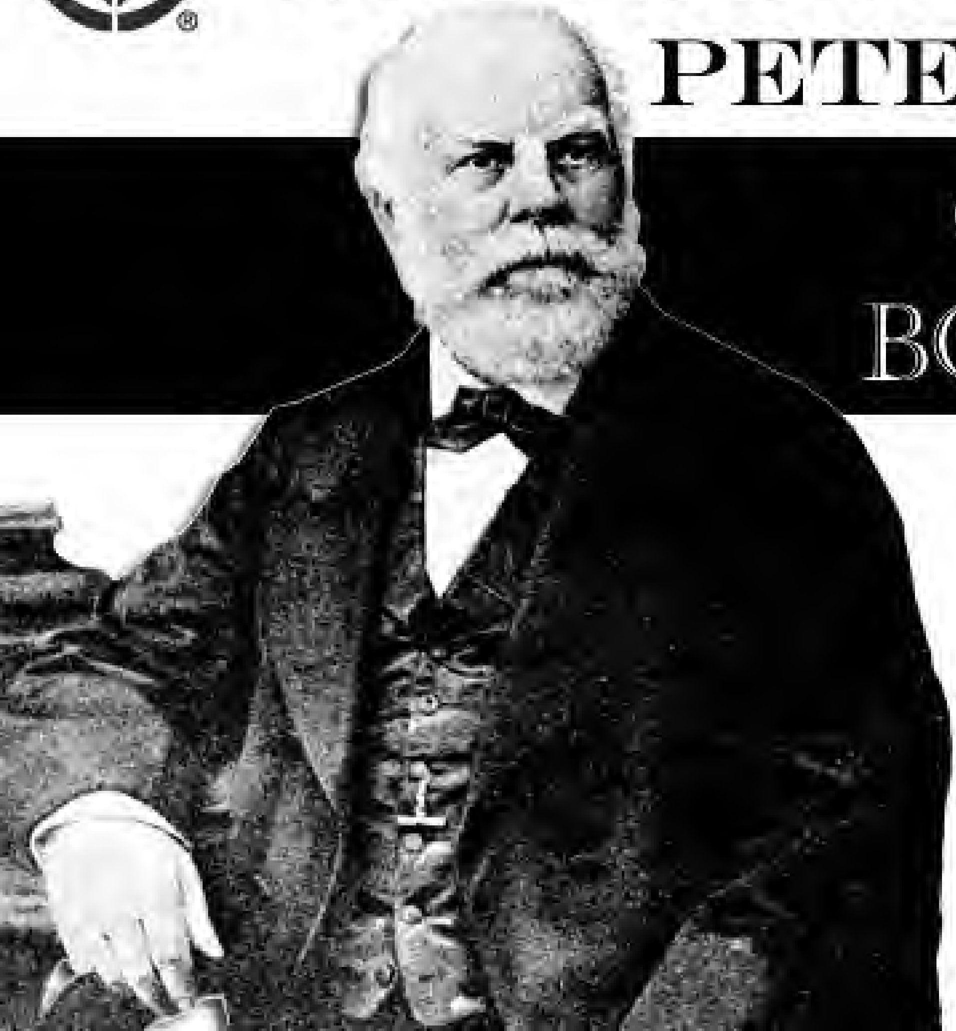
MISSOURI BOTANICAL GARDEN

PETER H. RAVEN LIBRARY

GEORGE ENGELMANN BOTANICAL NOTEBOOKS



Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

Q. Chrysolepis

1327 tree 2 feet diam, near Shasta Aug 21

1326 x 1 " 40' high " " " " – 2' diam – bark light ash gray cracking finely

777 New Idria July 20 Shrub 2 feet (or 20 feet high

1469 Feather River Sept acorn

1466 Cow Creek upper Sacramento Sept 12 feet + girth (acorn – coll)

1111

978 April 18 30' high Sonoma

98 Los Angeles Dec

1660 Yosemite Jun Cow bush

688 Santa Lucia Mts June 20 feet circumf. –

6054

(10 Redmens! June or July? Young and old fruit abundant)

1286 Jun 20 ~~1862~~ (I have no op is Q. Wislizeni!) 1½ feet circumf. branch low – bark rough & dark contrasts by its bright & shining green foliage with the blue of Douglasii

into Oregon! Klamath.

April 21–23 1863 head of Cnoidio Cañon – 5000–6000' el. the largest chrysolepis over 28' circumf.

Vaccinifolia ?

4891 [illegible]

1454
1357 should be 1454

2037 Ebbets Pass Aug 3 acorns a common Chapparal oak seen much higher

1952 Bigtree road July 30 3–4' high – Chapparal

1455 Summit of Weaver Vally 1 foot high

acorns sweet Sept acorns

6403

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

Expedition brought very fine specimens found there at an altitude of 6300 feet. – Fl. July and August. – This species seems in the southern part of Arizona to take the place of A. Parryi of the northern part of that territory, and is used there for the same purposes; it is easily distinguished from it by its longer and narrower leaves, ~~and~~ the ~~much~~ less deeply divided perigon and the slender capsule and small seeds. – Leaves 10–20 inches long, 2–2½ wide, slightly contracted above the base long pointed; terminal spine 8–14 lines long, deeply channeled to above the middle, decurrent with brown, horny margins ~~the~~ about 2 inches; lateral teeth ½–¾ inch apart, 1½–2 lines long often interspersed with smaller ones, straight, or usually hooked, or often, especially the lower ones, flexuous. Scape 8–12 feet high (bracts not noticed by the collectors); ~~with~~ branches of the panicle repeatedly and loosely ramified, ultimate pedicels crowded, about 1 line long. Flowers 1¾–2 inches long; perigon whitish, 10–12 lines long, filaments anthers and style purple, lobes usually a little shorter than the tube, exterior ones strongly cucullate and much thickened at the apex, interior shorter and broader and thinner; nectariferous part of tube, below the insertion of the stamens 2½–3 lines long a little longer than upper part of tube; exsert part of filaments about the length of perigon, anthers 8 lines long; capsules slender 18–24 lines long, 7–8 wide; seeds among the smallest of this section 2½ lines in the longest diameter, easily distinguished by the

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Q. chrysolepis Herb Gray 1877
San Bernardino Parry very large fruit
Sierra Valley Lemmon 1874
Fort Tejon Rothrock 1875
29 & 48 Fremont Dec 1845 forma microphylla
57 & 214
No 22 — — has normal leaves

Kellogg & Harford 965 Ukiah
Tuolumne River Lemmon
301 Bridges, large fruit
Yosemite Gray 1872

Vaccinii folia ~~Lemmon~~
Kellogg & Hartford 1868 No 914 Donner Lake 78
~~Bridges~~ 481 Torrey, Donner Lake 1865
~~Yo~~

Palmer

Q. tomentella Engm
Palmer 78 & 89

6404

page 385

Over a year has passed since the foregoing part of this paper has been published; of the concluding seven pages only a small edition for private distribution was then printed. Continued study of the genus, aided by numerous kind communications ~~from~~ of observations as well as of specimens have ~~necessitated~~ enabled me to make the following ~~changes &~~ corrections and additions. ~~which will be found below,~~ ~~and which must~~ thus be ~~accounted for~~ ~~discrepancies between the first and second part. In the former the subjoined alterations will have to be made~~

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

p°

Pg. 374. l. 22. Low shrubby forms of *Q. stellata* occur on the southeastern seacoast and of *Q. macrocarpa* in the northwestern plains.

l. 2 from below ought to read: the only oak-wood. — The wood of *Q. Prinus*, however, makes an exception, being more porous than most other White-oak woods.

A careful study of the numerous American oak woods ~~exhibited~~ displayed by the Agricultural Department and at the centennial exhibition in Philadelphia ~~and of such other specimens as were sent there~~ by different States, has revealed ~~further~~ interesting facts. The Black oaks grow, on an average, nearly twice as ~~fast~~ as the White-oaks and, if *Q. nigra* and the Californian evergreen Black-oaks be ~~excepted~~ left aside, the disproportion will be found ~~still~~ greater. In the average of 20 different White-oaks from all parts of the country I find the growth nearly equal th[illegible] the first 40 years; in 14 specimens of Black-oaks the growth is ~~nearly~~ more rapid in the first 30 years than between the 30th and 40th. The following little table will exhibit this more distinctly.

Small Type

Average width of the annual rings

	in 20 White-oaks	in 14 Black-oaks
In the first 20 years	0.8 lines	1.6 lines
from ~~the~~ 20th to the 30th year	0.8 "	1.7 "
from the 30th to the 40th year	0.7 "	1.2 "

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

the acrid ~~skin~~ rind off. Seeds 6–7 mm. in the longest diameter and 3 mm thick, very similar to those of *Y. aloifolia* but with the back less rounded.

(italics) *Yucca canaliculata*, Hooker, Bot. Mag. 86. t. 5201, 1860, described from a plant cultivated at Kew, with a stem 1–2 feet high, leaves 2 feet long, concave, semi-cylindric, rough on back, ~~most~~ very probably is not different from our plant; ~~though~~ the flowers, in a peduncled pyramidal panicle, 4 or 5 feet high, are described as sulphur-yellow, but are stated by ~~Mr~~ Baker in Gard. Chr. l. c. to be cream-white. – A specimen in Mr Henry Shaw's Missouri Botanical Garden, thus labeled, flowered in April 1872; its trunk is 4 feet high, the leaves 2½–3 feet long, panicle 2 feet long, 1¼ feet wide, very densely flowered; flowers 3–3¼ inches wide, segments ovate acute, outer 8–9, inner ones 9–11 lines wide; filaments strongly recurved, even ~~before dark~~ when the flower has just opened, ~~as the pollen is already discharged shed~~. anthers very slightly notched above, ~~with~~ a bunch of white articulated hair, corresponding with the hair at the tip of the perigon.

Yucca glauca, Sims, as understood by Baker and figured in Refug. bot. V. t. 315 ~~seems to belong~~ and *Y. exigua*, Baker ib. t. 314, which can scarcely be distinguished from it, are classed with the entire-leaved acaulescent Yuccas, though the former bears a few fibres; their fruit, in Europe, is unknown, but may possibly be capsular, of which more at the proper place. Both are characterized by the conical, attenuated, stigma.

Y. orchioides, Carrière, Rev. Hort. 1861. p. 369. t. 89 as quoted by Baker, is described as the smallest of all Yuccas, stemless like the last, with few short soft-pointed leaves (9–10 inches long,

1254 Arroyo del Puerto (Feather River?
(Sierra Valley just north of Castle Peak and the RR
not far from Pyramid Lake)
1286 Pacheco Pass
1317 Ray Cañon
(Redbluff or upper Sacramento)

Not. & Hb
1489

shrubby undulata 46.70. San Gabr., Sierra,

oblongifol. San Gabr.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

undulata tree Mt Diablo 1-2' Sacramento valley Gambelii Redbluff to Shasta

Lobata Sonoma 5' dia. Mt Diablo 5-6' dia. Hollenbeck very little north of Redbluff
(shrubby at Shasta) Sacramento valley ~~Trinity~~, Oregon line Klamath,

Garryana 3' dia. mostly less Hollenbeck Diablo Trinity Mts Shasta
near Sonoma — not higher up.

Chrysolepis ~~San~~ Gabr. Sta Lucia 6' dia Shasta 2' dia Feather River. Klamath
shrubby Sierra Yosemite ~~Big tree chapparal~~ — Ebbets Pass

vaccinifolia Yosemite 2-5' high 6-7000 alt. Ebbets Pass, Big tree chapparal

Agrifolia San Gabriel 3-4' dia. Sta Barbara. Mt Diablo 5' dia Hollenbeck (none at Redbluff and north.
Shrub. Santa Lucia

Wislizeni Los Angeles shrubs Mt Diablo Strawberry Valley (Sacramento) Crater at Battle Creek upper Sacrat
tree Mt Diablo Pacheco Pass 3½' dia near Almaden 4' dia

Sonomensis Monterey Marin. Sonoma, 3' dia Hollenbeck Almaden up to 5' dia
Yosemite common and large Below Sonora Pass on Stanislas common 5000 bar. alt
Big trees common. Klamath

densiflora Sta Cruz. Trinity Mts tree 50-60' or shrub.

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI
BOTANICAL
GARDEN

Q. vacciniifolia Bolander "small shrub, 3-6' high" up to 8000' in the Sierra". Ament single from axils of lower leaves, smooth even youngest leaves & branchlets smooth — no Chrysolepis scales at all — Saw leaves on axes 5 years old.

2037 slight stellate pubescence on young petioles & peduncles
sp. with very young fruit (in fall?) — some leaves sub- or serrate
1952 with old ♂ males axis of aments stellate ~~p~~ sub pubesc.
1455 in fruit, 5 good distinct ~~basal~~ inferior ovules
1354 lower side of leaf stellate pubescent not scurfy — branchlets also
fruit or at least cupule large tip of scales in all vacciniifolia glabrous, brown

6406

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI
BOTANICAL
GARDEN

Rothrock 1.

Rothrock's Quercus

Quercus undulata Torr. a scrubby [illegible] with annual mat[illegible] fructification, very variable in foliage and to some extent also in stature and habit. leaves from [illegible] to 3 or even 4 inches long (persistent or deciduous), bluntly lobed or even pinnatifid, or spinose-dentate or entire, always pubescent, downy on the lower side; fruit sessile or [illegible] sometimes long-peduncled, cups rather deep, [illegible] nut oblong, obtuse, sometimes elongated [illegible], sweet [illegible].

Var. Gambelii Engl. (bush or small tree with [illegible] bluntly lobed dark grey [illegible] leaves, fruits in deep strongly tuberculate cups. Q. Gambelii Nutt.) [illegible] is a tree 20 or 30 high [illegible] alt. 7500' Rothrock No. 252 187[illegible]

var. Jamesii Engl. (the original Q. undulata Torr.) with smaller deciduous leaves 1½–2 inches long with [illegible] shallow sinuate lobes or merely coarsely toothed; Santa Fe, Rothrock 57, 1873.

var. pungens Engl. (Q. pungens Liebm.) with much smaller rigid leaves 1 inch long [illegible] coriaceous texture, spiny-dentate, with smaller [illegible] long [illegible] tuberculate but less tuberculate cups [illegible] all the [illegible]

var. [illegible] with small oblong more or less entire [illegible] coriaceous leaves [illegible] smooth or slightly [illegible] smooth or somewhat rather [illegible] above [illegible] acorns long-peduncled [illegible] Camp Apache [illegible] 1873 [illegible] Rothr. 1874 [illegible] No. 292 [illegible] form of this [illegible] long [illegible] longer peduncles [illegible]

var. grisea Engl. (Q. grisea Liebm.) with [illegible] leaves often cordate at base, entire or irregularly dentate [illegible] below [illegible] and like the branchlet yellowish [illegible] pubescent [illegible] sessile [illegible] Camp Apache [illegible] 1873 [illegible] tree [illegible] 20 feet [illegible] 508 Rothr. 1874.

[illegible] These [illegible] forms [illegible] connected [illegible] in the [illegible] specimens [illegible] short-petioled [illegible]

Q. reticulata Hook. [illegible] shrubby [illegible] persistent [illegible] cordate at base, [illegible] strongly reticulate and [illegible] below [illegible] fruit [illegible] sparsely stellate [illegible] half as long as the leaf [illegible] acorns in [illegible] very knobby cups [illegible]

5. small type

6407

1. A. Fraseri, (Pinus, Pursh fl. 2.639. 1816; Parlatore in DC. Prod. 16.2.419) Lindl. Pen. Cyc. 1. No 5 (1833), Forbes, Link etc. This ~~and bracteata~~ ~~are~~ probably the most local species in the U. States, being confined to the tops of the highest Mountains of North Carolina, which have an altitude of ~~to or above~~ 6000 feet or more ~~alt.~~, and the tops of which ~~where it occurs~~ it covers together ~~intermixed~~ with some Picea nigra, but it never occurs mixed with the following species. — A small tree rarely as much as 30 or 40 feet high or ~~8 or 12~~ 12 or 18 inches in diameter, probably never more than 60 to 75 years old, with cinnamon brown smoothish bark; readily distinguished from balsamea by the shorter, more oval cones with largely exsert and reflexed bracts, and always, even when sterile, by the almost uninterrupted stratum of hypodermic cells on the upper side of the leaf, more crowded on the edges. The white bands on the underside of the leaf consist usually of 8 or 10, or even 12 series of stomata; hight ~~length~~ ~~width~~ of scales (without the stipe) equal to one half or two thirds their width. length of seeds equal to length and ~~to~~ width of wing. — Forms of the next species, with exserted tips of bracts ~~The species has often~~ ~~have probably given rise to been mistaken for this species~~ ~~been claimed~~ in ~~for~~ the Mountains of Pennsylvania, ~~of~~ Vermont, and other northern regions, ~~but it appears that to~~ seem to have been mistaken for this species, In eastern as well as in European gardens ~~that~~ forms of balsamea ~~is~~ are often cultivated ~~as Fraseri~~ under the name of Fraseri.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

2. A. balsamea (Pinus, Lin Sp. pl. 1421, 1753; Parl. l. c. 423) Marshall Arb. Am. 102, Link etc. A. balsamifera Michx. fl. 2. 207 in part. — The north-eastern „Balsam" extends from Canada ~~extends from Canada~~ ~~along~~ the north-eastern States along the mountains to Virginia and along the Great Lakes to and beyond the Mississippi. It is a larger tree than the last, often 70 feet high, 1/2 ~~foot~~ in diameter and up to 150 years old; bark smooth and ~~whitish~~ ~~grayish~~ reddish-gray when young, brown and much cracked in old trees. Its slenderer cones with enclosed bracts (their points ~~margins~~ only sometimes protruding) and especially the leaves with scarcely any hypoderm cells above and very few on edges and keel (fewer than in any other four species and sometimes none) and with narrower bands of stomata below (of 4-8, usually about 6 series) readily distinguish it. ~~Abies~~ A. Hudsonia of the Gardens, often considered as a form of Fraseri is a sterile dwarf form of balsamea ~~of the Fir~~ found also on the White Mountains of New Hampshire above the timber line.

copyright reserved
MISSOURI BOTANICAL GARDEN

Rothrock 2   Rothrock ~~302~~ 759 1874

On Mt Graham Ariz. 9500 feet alt. a shrub 2-4 feet high with leaves 2 inches long and 1½ wide exactly, agrees perfectly with the Mexican forms which I have seen to make large trees, mostly with larger leaves; ~~[illegible]~~ and Castanea-like leaves were found persistent on a [illegible] [illegible].

Q. dumosa Nutt. Engelm. l.c. 382 & 393 [illegible] Cañon 4100 alt. a form with larger [illegible] acorn cups with small brown downy scales [illegible]

Q. chrysolepis Liebm. [illegible] large, tree with large acorns, but smaller [illegible] leaves, Fort Tejon [illegible] Engelm. l.c. 382, 394

Q. Emoryi Torrey Bot. ~~[illegible]~~ Exped. 1848 151. t. 9.

Q. hastata Liebm. A shrubby or arborescent Black Oak with rough black bark and dark green foliage, downy when young, glossy above and densely glabrous after, and persistent until the new leaves come out; ~~[illegible]~~, leaves 1½-2 inches long 5-9 lines wide, ~~[illegible]~~ lanceolate, on very short downy petioles, with cordate or hastate base, tapering to a sharp point, ~~[illegible]~~ repand spinous-dentate, or ~~[illegible]~~ entire; ~~[illegible]~~ staminate flowers with 4-5 lobed [illegible], pistillate with long recurved 2 styles ~~[illegible] with [illegible]~~ fruit sessile, maturing the first year, cup hemispherical with appressed brown triangular obtuse ciliate scales, acorn about ⅓ of the [illegible] long pointed ~~[illegible]~~

Rocky Cañon Ariz. [illegible] Rothrock, 287 [illegible] extending through [illegible] Mexico; [illegible] Botanically [illegible] many characters [illegible] maturing [illegible] especially the [illegible] at the base of the nut, with the black bark and [illegible] wood [illegible] elongated [illegible] styles and [illegible] of shells; leaves as in most Blackoaks, with stronger reticulation above than on the under side

Q. agrifolia Nee a large tree common about Santa Barbara etc., Rothrock 1875 163. 164

Am~~erican~~ Naturalist 1876 p. 554

3. *A. subalpina*, Engelm in ~~"Field and Forest" 1876 p~~ ... *A. lasiocarpa*, Hook. Fl. B. A. 2. 163.? *A. bifolia*, Murr. Proc. R. Hort. Soc. 3. 318. *A. amabilis*, Parl. l. c. 426 in part. – Closely allied to the last species, ~~as~~ the western representative of which it must be considered; it extends from the higher Mountains of Colorado and the adjoining parts of Utah northward to Wyoming and Montana, where it is the only species, and westward to the higher mountains of Oregon, + and into ~~the~~ British Columbia (Fraser's River) and southward probably to Mount Shasta, always scattered in the subalpine forests, and, at least in Colorado, coming up almost to the timber line, but never (constituting forests by itself). It is a ~~pretty~~ larger tree than balsamea, often over 2 feet in diameter and 60 ~~to~~ 100 feet high with thin pale, whitish smooth bark, which only in very old trees becomes cracked and ashy gray; timber (so soft and poor), ~~so~~ that in some parts of the Rocky Mountains it is called pumkin pine; leaves ~~similar~~ like ~~to~~ those of *balsamea*, notched on sterile and pointed ~~on the~~ fertile branches ~~pointed~~, ~~but with~~ hypoderm considerable, though interrupted ~~hypoderm~~, on the upper surface, crowded on edges and keel. Cones 2–3½ inches long, (retuse, brown purple) 1–1¼ inches in diameter, the smaller ones ~~are~~ near the timber line. Scales rounded or almost square, often almost as high as broad, similar in proportion to those of *balsamea*, but larger; bracts ~~short~~ emarginate, mucronate; ~~seeds~~ wings ~~as in that species, much less wide narrower than long~~ seeds, including the wing, over 1 inch long, the latter nearly twice as long as it is wide.

Var. *fallax* has the resin ducts of this species, but the foliage almost of *concolor*; leaves sometimes 1½ or even 1¾ inches long, mostly obtuse, and covered with stomata above, glaucous when young. – Dr Newberry's specimen in the Herb. Agricult. Dep. Washington, collected on the higher ~~taps~~ tops of the Cascades, south of the Columbia River, and described * foot note ~~in pa~~ by him as *A. amabilis* in Pac. R. Rep. 6. bot. 51 belongs here; the loose scales ~~are~~ (12 lines wide, 11 high with more pointed bract, seed with narrow wings, as in the species but larger), brought home, indicate a large cone, such as he describes as 6 inches long and 2½ thick. S. Watson and lately A. L. Siler collected a similar form on the Wasatch Mountains – but the loose broad scales sent by the former may possibly belong to *concolor* which grows

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Rothrock 3

an evergreen black oak with small mature fruit

Q. hypoleuca Engelm. l.c. p. 384. — Q. confertifolia Torr. Bot. Mex. Bound. 207 not H.B.K. A small or medium sized ~~[illegible]~~ evergreen tree, ~~with lanceolate short petioled~~ with dark rough bark; leaves coriaceous lanceolate or oblong lanceolate, tapering into a short petiole, 2–3½' long ½' wide ~~convolute~~ ~~[illegible]~~ glabrous and glossy above, margin revolute, entire or with a few broad teeth towards the top, ~~revolute~~ white tomentose with [illegible] smooth and [illegible] below; ~~[illegible]~~ ~~[illegible]~~ glabrous [illegible] [illegible]; second styles [illegible], [illegible] ovate [illegible] obtuse [illegible]

Sonoita Valley, Southern Arizona, 7000' high — Roth. (653 in 1874). Also from ~~[illegible]~~ [illegible] Mule Mountains, Capt. E.K. Smith; Sierra del Pajarito, Abbott. — A very ~~[illegible]~~ conspicuous and distinct ~~[illegible]~~ species, ~~apparently allied in its vegetation to the Calif.~~; Dr Roth. found it 30 feet high and 1 foot in diameter.

Q. [illegible] Benth. in [illegible] II Gray

Roth. 205 [illegible] 1875 [illegible]

Castanea chrysophylla Hook. a var. or [illegible] shrub 8 feet high

on the Olancha Mountains, Calif.

8–10400 feet alt. Roth. No. 244

bundles (in the flat leaves). Both forms occur sometimes in the same species. The bundles show the larger (ligneous) cells above and the smaller (bast-) cells below, they are surrounded by small pith-like cells and the whole separated from the parenchyma by a sheath of larger cells.

On the differences of the leaf structure we can base the subdivisions of the genus with much greater certainty than on the length of the bracts, as was formerly done.

small type

Sect I. Balsameae: Resinducts within the parenchyma, in the interior of the leaf; leaves on lower branches notched & on fertile branches entire, obtuse or often acute, and mostly without stomata on upper side, mostly with + a few or more stomata above ~~upwards~~ towards the tip. — Two eastern and one northwestern species

× Exsertae: bracts protruding, recurved.

1. A. Fraseri.

× × Inclusae: bracts shorter than the scales,

2. A. balsamea,

3 A. subalpina.

Sect. II Grandes: Resinducts close to the epidermis of the lower side, towards the edges; Leaves on lower branches notched or obtuse, on upper obtuse, rarely ever acute; bracts inclosed. — Two western species

4 A. grandis.

5. A. concolor.

Sect III. Bracteatae: Resinducts as in last; upper side of the rigid, mostly acute leaves without stomata, with a continuous layer of hypoderm cells, usually similar cells within the sheath of the fibro-vascular bundle, pallisade-parenchyma very strongly developed; bracts exserted. — A south western and a Mexican species.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

6. A. religiosa.

7. A. bracteata.

Sect IV. Nobiles; Leaves of the ~~fertile~~ adult trees and especially of the fertile branches quadrangular, short, curved, ~~but~~ scarcely twisted + resinducts close to the epidermis of the lower side, ~~and (in the square leaves~~ ~~near the middle~~ equidistant from the edge and keel; fibro-vascular bundles single; stomata on both sides. Leaves of young trees much like those of sect. II.

~~and espec~~ × Exserta

8. A. nobilis

× × Inclusa

9. A magnifica.

copyright reserved
MISSOURI BOTANICAL GARDEN

Gray has Wright 1868 our Comm. specim. [illegible] undulata
" 664 pungens Lieb.! as to Wright's plant undulata
" 1866 oblongifolia
" 665 grisea Lieb.!
Torrey " 1867 long pedunculate oblongifolia
" Fremont Exp. 1849 Emoryi! foliis subinde integris
Wright 1865 Emoryi!
Gray Coulter 661 Q. berberidifolia Lieb.!

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved MISSOURI BOTANICAL GARDEN

[illegible]

as subbaccata demum dehiscens; Kunth, Enum. and later botanists have followed Endlicher. In the Botanical notes to Wislizenus' Memoir of a tour to New Mexico etc, 1848 p. 101 I first distinguished the Yuccas with "juiceless capsules and thin seeds" from those with "succulent fruit and thick seeds". Subsequent American botanists (~~especially~~ Torrey in Bot. Mex. Bound. p. 221 and especially Chapman in Southern Flora p. 485) confirm and adopt these ~~characters~~ differences. In S. Watson's Botany of the 40th Parallel (Utah and Nevada) 1871 I have briefly

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS
6410 (2)